

NOTES ON THE GENUS CLERODENDRUM (VERBENACEAE). XXVIII

Harold N. Moldenke

CLERODENDRUM Burm.

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*CLERODENDRUM JAPONICUM* (Thunb.) Sweet

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Illustrations: Kwa-wi [transl. Savatier], Arbor 2: pl. 10. 1759; Banks, Icon. Sel. Pl. Jap. Kaempf. pl. 58. 1791; Morr., Ann. Soc. Roy. Agr. Bot. Gand. 1: pl. 3 (in color). 1845; Caspary, Dissert. Inaug. Nect. pl. 3, fig. 31. 1848; Regel, Gartenfl. 5: pl. 178 (in color). 1856; Carr., Rev. Hort. 46: 110/111 (in color). 1874; Regel, Gartenfl. 29: pl. 24 (in color). 1880; Baines, Garden Lond. 19: 453. 1881; Nicholson, Illust. Dict. Gard. 2: 341. 1887; Lubbock, Seedlings 2: 373. 1892; "W. W.", Garden Lond 42: 563. 1892; Useful Pl. Jap. 2: pl. 500 (in color). 1895; Apgar, Ornament. Shrubs U. S. fig. 509. 1910; E. H. Wils., Arnold Arb. Exped. China pl. 216. 1912; Mak., Illust. Fl. Jap. [893]. 1924; Mak., Illust. Fl. Nipp. 186. 1940; Mold. in Gleason, New Britt. Br. Illust. Fl. 3: 138. 1952; Hara & al., Spring Fl. Sikkim Himal. pl. 221 (in color). 1963; Corner & Watanabe, Illust. Guide Trop. Pl. 758. 1969; Duke & Ayensu, Med. Pl. China 2: 638. 1985.

A semi-woody, regular bush, erect shrub, or undershrub, 0.5--2.8 m. tall, often low and single-stemmed, ornamental, or a small tree, 3--5 m. tall, sometimes a climber [*fide* Chung 2351], ill-smelling; branches, when present, rather thick, puberulent when young; bark gray, smooth, rarely with conspicuous lenticels; branchlets stout, very medullose, very obtusely or acutely tetragonal, green or reddish-green, often deeply sulcate between the angles in drying, brownish when dry, densely puberulent, sparsely lenticellate; pith lamellate; nodes annulate, the larger ones marked with a narrow circumferential band of villous tomentum; principal internodes 3.8--11 cm. long; leaves large, decussate-opposite; petioles stout, 1.5--2.2 cm. long, cylindric, basally amplate, often red, puberulent, often collapsing at the base and sulcate above in drying; leaf-blades thinly chartaceous, very dark-green on both surfaces, usually brunescent or nigrescent in drying, ovate or broadly ovate to orbicular or sub-orbicular to obovate, 7--25 cm. (or more) long, 7--25 cm. wide, apically acute or short-acuminate, marginally remotely serrate or glandular-denticulate throughout with appressed crenate teeth and very shallow sinuses, basally deeply cordate or auriculate, sparsely setulose or strigillose above or glabrate except for the puberulent venation, minutely puberulent along the venation and very densely lepidote-squamulose beneath with rather large, thick, round, light- or golden-yellow peltate scales; midrib slender or stoutish, often red, flat and often more or less densely pulverulent-puberulent above, prominent beneath; secondaries slender, 4--9 per side, often red, flat above, prominent beneath, the lowest 2 or 4 issuing palmately from the very base of the lamina, without axillary glands, ascending, not much arcuate; vein and veinlet reticulation rather sparse, the larger veins (tertiaries) issuing from the lowest pair of secondaries prominent beneath, the remainder mostly obscure on both surfaces; inflorescence supra-axillary and terminal, mostly forming a large, rather open, villous terminal panicle to 30 cm. long and wide; axillary peduncles divaricate, about 6 cm. long, red-

dish; cymes very wide-spreading, long-stipitate, 11--25 cm. long, loosely many-flowered, 4--8 cm. wide, solitary and opposite in the uppermost leaf-axils; terminal panicle very lax, often massive with greatly elongated reddish-tinged sympodia and 4--6 pairs of widely divergent, loosely and comparatively few-flowered cymes; main peduncles stoutish, 4.5--15.5 cm. long, puberulent, often sulcate in drying, brown or buff to purplish; pedicels very slender, 7--27 mm. long, puberulent; bracts conspicuous, a pair subtending each pair of cymes in the terminal panicle, large and foliaceous, oblong or elliptic to ovate, long-stipitate, to 4 cm. long and 1.5 cm. wide; bractlets oblong or linear, numerous, to 2 cm. long and 2.5 cm. wide, often red, puberulent; prophylla linear, elongate, 4--10 mm. long, red-tinged, puberulent; flowers ill-smelling or odorless [depending on time of day?], showy; calyx campanulate, deeply 4-fid (practically to the base), the lobes thin-textured, bright-red or scarlet, triangular-lanceolate or triangular, 10--17 mm. long, basally 4--7 mm. wide, apically shortly or attenuately acuminate and subulate-tipped, lepidote and puberulent; corolla hypocrateriform, mostly brightly deep-red or scarlet, in all 2--3 cm. long, the tube cylindrical, 1.5--2 cm. long, about 2 mm. wide, slightly curvate, externally sparsely villous, the limb rather irregularly 5-lobed, 1.5--2.5 cm. in diameter, the lobes elliptic or oblong, 8--12 mm. long, 3 mm. wide; stamens 4, unequal, inserted in the upper part of the corolla-tube, exerted 1.5 cm. from the corolla-mouth; filaments slender, 4--5 cm. long, slightly villous; anthers versatile; style slender, 4--8 cm. long, exerted, 3 times (or more) as the corolla-tube, glabrous; stigma minute; ovary superior, 4-celled; ovules pendulous; fruit drupaceous, at first enclosed by the mature calyx whose lobes finally become reflexed, black, edible.

This much misunderstood species is based on a collection made by Thunberg in Japan, of which I have examined photographs of both the holotype and an isotype (cited below).

Because of the confusion which has surrounded this species, I am reproducing herewith the most excellent (although misidentified) and very typical illustration given of it by Morren in 1845. The original specimens of Fischer's "*Clerodendron Kaempferi*", which Morren's plate depicts, deposited in the Leningrad herbarium, have also been examined personally by me. Thunber (1784) avers that the species was originally introduced into Japan from Korea.

Collectors have found this plant growing in moist areas, on grassy hillsides, along roadsides and on riverbanks, in cafetal and cultivated ground, in shade or partial shade, in heavy humus or loam, at the margins of forests or thickets, and in secondary deciduous woods on yellow argillaceous soil, at altitudes of 16--1360 m., in flower in February and from April to September, and in fruit in October. In Burma Belcher reports it growing "solitary in thick scrub on hillsides", while in Kwangtung it is reported to be "fairly common as scattered shrubs in dry sandy soil". In Veracruz (Mexico) it is said to be "abundant in yellowish-red rocky soil in high subevergreen secondary forests", obviously introduced and naturalized.

The corollas are described as "red" by Walker (1976) and on *Chiao*

Pl. 3.



[from Morren, Ann. Soc. Roy. Agr. Bot. Gand. 1: pl. 3 (in color). 1845]



1495, Chung 2893, Esquirol 123, Herb. Canton Chr. Coll. 12540, Herb. Nanking Univ. 14694, Hernandez & al. 175, Peng & al. 541, Steward & Cheo 669, Tsang 21068, Tsang & al. s.n., Tsing 2123, Vazquez 398, and Ying 853, "deep-red" on Chung 4042, "bright-red" on Ching 1900, King 1010, Walker & al. 6186, and Williams 9632, "scarlet" by Fang (1944) and Hara (1963) and on Smith 1 and Wilson 4555, "purple" on Chung 2351, and "yellow" on Murça Pires & Black 1308.

*Clerodendrum japonicum* appears to be native to Nepal, Assam, Upper Burma, and China, naturalized in Japan, Indochina, the Ryukyu Islands, Indonesia, Surinam, Brazil, Mexico, and elsewhere. It is often cultivated in tropical and subtropical regions, and under glass elsewhere. The Surinam record is based on several collections in the Utrecht herbarium from the forest near the Agricultural Experiment Station at Paramaribo, where, presumably, it had been cultivated and later escaped and became naturalized. In Maryland the record is based on a collection from "in the woods near Chevy Chase" made by D. A. Bisset on September 20, 1912, deposited in the U. S. National Arboretum herbarium.

Loudon (1830) asserts that the species was introduced into cultivation in England in 1820 from Japan; Sweet (1827) gives the date of introduction as 1823, but in the 1830 edition of his work adds that the flowers are "wh[ite]" -- probably the white-flowered form described hereinafter

Walker (1976) says of the species "Native of Malaya or southern Asia, thus misnamed '*japonica*'" and that it is only introduced in Okinawa. P'ei (1947) records it from Szechuan. Masamune (1955) and Sonohara & his associates (1952) also claim that in Okinawa it is only introduced. Rao & Verma (1969) list it from Assam, but it seems most probable that, in this case, they are referring, instead, to *C. philippinum* Schau. Matuda (1950) found *C. japonicum* in cultivation in Escuintla, Guatemala, as well as in Chiapas, Mexico. King refers to it as a "not common shrub", apparently wild, in Veracruz, Mexico. Babu (1977) reports it cultivated in Dehra Dun, India. Fournet (1978) lists it from Guadeloupe, but as yet I have seen no authentic material of it from that West Indian island.

Common and vernacular names reported for *Clerodendrum japonicum* include "ch'au shi mut li", "chau sze mool lai", "chirinto", "fi giri", "figiri" [=fire-tree], "go too", "go too giri", "hé bǎo huà", "higiri", "hi-giri" [=scarlet *Paulownia*], "hi guiri", "Japan clerodendrum", "Japanese gloryberry", "Japanese glorybower", "shuin", "t'ung", "tei too", "too guiri", "volkameria du Japon", and "wan hon na wan njari". The numerous other names recorded seem, rather, to apply to *C. kaempferi* (Jacq.) Sieb. or to *C. philippinum* Schau or its f. *multiflex* (Sweet) Mold.

Because of the wide misapplication of the name, *Clerodendrum japonicum*, a brief survey of some pertinent items in the literature follows:

Lamarck (1808) translates Thunberg's original description of *Volkameria japonica* as follows: "C'est, d'après Thunberg, un arbre très élevé, dont la cime est ample, très-glabre; les rameaux paniculés, un peu comprimés a leur partie supérieure, garnis de feuilles alter-

nées, petiolées, ovales, fortement échanquées en coeur à leur base, veinées, acuminées à leur sommet, glabres, plus pâles en dessous; les inférieures longues d'un pied, larges d'environ sept pouces; les supérieures insensiblement plus petites & plus obtuses; le pétiole long de sept pouces aux plus grandes feuilles, & de dix lignes aux plus petites. Les fleurs sont disposées en grappes à l'extrémité des plus jeunes rameaux; les pédoncules partiels simples, unilatéraux, uniflores, droits, longs d'un demi-pouce, accompagnés chacun d'une bractée solitaire, subulée, plus courte que le pédoncule. La calice est rousseâtre, divisé en cinq découpures écartées à leur base, concaves, lanceolées, terminées par une arête. La corolle est irrégulière; le tube cylindrique, de couleur purpurine, une fois plus long que le calice; le limbe à cinq découpures presque égales, plus courtes que le tube. Le fruit est une capsule ovale, à quatre sillons, de la grosseur d'une prune, à quatre valves, à deux loges. s'ouvrant transversalement. Cette plante croît au Japon. † (Descrip. ex Thunb.)"

Siebold & Zuccarini (1846) comment that "Schon Willdenow bemerkt, (Spec. plant. III. p. 385) mit Recht, dass die Thunbergische *Volk. japonica* nicht mir der in Gärten unter diesem Namen kultivirten Pflanze zusammengezogen werden könne, und nennt in der Enumeratio hort. berol. p. 659 letztere *Cler. fragrans*. Persoon führt ebenfalls *V. japonica* und *fragrans* gesondert auf. Erst die neueren Schriftsteller ziehen beide wieder zusammen, lassen dagegen aber *Cl. squamatum* oder *Kämpferi* als einige Art bestehen. Allerdings scheinen zwar zwischen dieser und *Volk. japonica* Thunb. nach des Letzteren Beschreibung seine Pflanze einige Verschiedenheiten obzuwalten, aber da Thunberg, Kämpfer a. s. O. zu seiner Pflanze citirt, dessen Beschreibung offenbar auf *Volk. Kämpferi* hinweist (*Fi kiri, i. e. ignea kiri, a colore igneo stylos floridos, perianthia ac flosculos tingente*), so dürfte dieses die Abweichungen in der Beschreibung ausgleichen und demnach *Cl. squamatum* als identisch mit *Volk. japonica* Thunb. zu betrachten seyn, [sic] *Cler. fragrans* dagegen als eigne Art bestehen, deren Stammform mit einfachen Blüten jetzt auch schon in Gärten vorkommt. *Cl. squamatum* ist nach Thunberg aus Korea nach Japan verpflanzt, ob *Cl. fragrans* auch in Japan sich finde, scheint noch zweifelhaft. Im Sieboldtschen Herbarium wenigstens fehlt sie."

Backer (1916), in his discussion of what he called *C. squamatum* Vahl, very truly remarks that "Veranderlijk wat betreft de lengte van kelk en kroonbuis. De javaansche exemplaren behooren alle tot de varieteit *japonicum* Hasskarl, waarbij de kelk 10--17 mM hoog is en de kroonbuis 15--20 mM lang. Op Sumatra en ook elders vindt men den typischen vorm, waarbij de kelk 8--10 mM, de kroonbuis 18--25 mM lang is. Op de Philippijnen treft men, behalve deze beide vormen, nog een tusschenvorm aan." His *C. squamatum* we now call *C. kaempferi* (Jacq.) Sieb., the var. *japonicum* is *C. japonicum* (Thunb.) Sweet, and the "intermediate" Philippine form is *C. bethunianum* Low.

Maheshwari (1966) claims that "*Clerodendrum fragrans*, which is accredited to Ventenat.....needs a revision. Moreover, the oldest validly published name for this plant is that of Thunberg, *Volcanaria japonica*, of 1784. Huber (in Fl. W. Trop. Africa 2: 443.

1963) believes that its correct nomenclature and synonymy would be as follows: *Clerodendrum japonicum* (Thunb.) Sweet, Hort. Brit. (ed. 1) 322. 1827; Huber, loc. cit. Basionym: *Volkameria japonica* Thunb. Fl. Jap. 255. 1784. Synonyms: *Volkmannia japonica* Jacq. Hort. Schoenbr. 3: 48. t. 338. 1798; *Volkameria fragrans* Vent. Jard. Malm. 2: t. 70. 1804; *Clerodendrum fragrans* Vent. loc. cit. (in syn. under *Volkameria fragrans* Vent. loc. cit.)." Jackson (1893) also reduces *Volkameria japonica* Thunb. to *Clerodendrum fragrans* Vent. This disposition, however, I cannot accept!

My good friend, William T. Stearn, in a letter to me dated February 8, 1966, says: "In Taxon 15 no 1 (Jan. 1966) p. 44 you will find a note by J. K. Maheshwari entitled 'A new combination in *Clerodendrum* L.' in which the name *Clerodendrum japonicum* (Thunb.) Sweet var. *pleniflorum* (Schauer) Maheshwari is proposed for the double-flowered plant usually and rightly known as *C. fragrans* (Vent.) Aiton f. var. *pleniflorum* Schauer. This is the name we have adopted in the Flora of Barbados 357 (1965) and which you have used in your many publications on the *Verbenaceae*. I assume you have seen Thunberg's type of *Volkameria japonica* and that Juel was right in identifying it with *C. squamatum* Vahl. If so, then the name *C. fragrans* stands and *C. japonicum* var. *pleniflorum* drops in to synonymy. There is a danger, however, that unless a note is published soon in Taxon correcting Huber and Maheshwari people who do not know any better will follow them...." Howard & Powell (1968) have shown that it is *Volkmannia japonica* Jacq. which belongs in the synonymy of *Clerodendrum philippinum* [the name now used for the old *C. fragrans*], not *Volkameria japonica* Thunb.

A perusal of the literature relating to *Clerodendrum japonicum* reveals, at least in my estimation, that the plant referred to by this binomial by at least the following authors is actually *C. kaempferi* (Jacq.) Sieb.: Backer & Bakhuizen (1965), L. H. & E. Z. Bailey (1941, 1974), Banerji (1965), Hara (1948, 1972), Holthuis & Lam (1942), Hsiao (1944), Lam (1945), Lam & Meeuse (1942), Makino (1903), Mattoon (1958), Ohwi (1965), Pande (1967), and Yamazaki (1966). Further, the following authors erroneously reduce it to synonymy under *C. squamatum* or *C. kaempferi*: Alexander (1971), Corner & Watanabe (1969), Franchier & Savatier (1875), Maximowicz (1886), Syngé (1956), and Voss (1895). The Baileys, in their 1976 work, correctly maintain *C. japonicum* and *C. kaempferi* as separate species.

The following authors use "*C. japonicum*" as the valid name for what I regard as correctly called *C. philippinum* f. *multiflex* (Sweet) Mold.: Aiton (1812), Bretschneider (1898), Desfontaines (1815), Huber (1963), Maheshwari (1966), Maheshwari & Chakrabarty (1966), Nielsen (1965), Raizada (1968, 1978), Rau (1969), Saxena (1970), Singh (1972), and Varma (1981). Singh refers to the flowers as "purplish-white" and Varma describes them as "double", which is certainly sufficient evidence that the plant referred to is *C. philippinum* f. *multiflex*, not *C. japonicum*. The illustrations given by Corner & Watanabe and by Maheshwari & Chakrabarty are on this account not included by me in the list of illustrations for *Clero-*

*dendrum japonicum* on a previous page of the present work.

As further examples of the almost hopeless mixups in the given or assumed synonymy of this taxon, may be mentioned the following: Hara (1948, 1972) gives as synonyms of *C. japonicum* the following: *Volkameria kaempferi* Jacq., *V. kaempferiana* Jacq., *Clerodendron squamatum* Vahl, *C. kaempferi* Sieb., *C. imperialis* [sic] Carr., and *C. japonicum* (Thunb.) Mak. Masamune, writing in 1955, places in its synonymy *C. squamatum* Vahl, *C. intermedium* Cham., *C. paniculatum* Hook. & Arn., *C. viscosum* Vent., and *C. infortunatum* "L. ex Maxim.!"

Merrill, in a longhand notation in his copy of Loureiro's 1790 work claims that the "*Clerodendrum infortunatum* L." of Loureiro is actually *C. japonicum*, but I feel, from a careful perusal of the description, that it is a combination of *C. kaempferi* and *C. viscosum* - mostly the former. In his 1935 work, in commenting on the "*Clerodendrum infortunatum* (non Linn.) Lour.", said by Loureiro "Habitat Cantone Sinarum", sums up: "Loureiro's description applies unmistakably to the widely distributed species currently known as *Clerodendron squamatum* Vahl, for which H. Lam cites about twenty synonyms. *Clerodendron japonicum* (Thunb.) Sweet Hort Brit. 322. 1826, Makino in Bot. Mag. Tokyo 17: 91. 1903 is the oldest binomial, if Dr. Lam be followed in treating this as a collective species, as it was based on *Volkameria japonica* Thunb. which dates from 1784. Doctor Carl G. Alm kindly supplied me with excellent photographs of Thunberg's type with critical notes. Thunberg's statement: 'Arbor vasta, excelsa' is an error; the species is a small shrub. The plant is not 'tota glabra', the branches of the inflorescence being densely hairy and with numerous intermixed glandular hairs but the pilosity is not visible to the naked eye. The leaves are glabrous. This form differs from *C. squamatum* Vahl, among other characters, by its much larger calyxes. The form with smaller calyxes, which is not uncommon near Canton, is *C. kaempferi* (Jacq.) Sieb. (*C. squamatum* Vahl), and this I believe to be specifically distinct from *C. japonicum* (Thunb.) Sweet."

Carrière (1874) gives the following description of his *Clerodendron imperialis*: "Tel est le nom sous lequel on trouve dans quelques établissements horticoles une des plus jolies plantes qu'il soit possible de voir, que nous allons décrire, et qu'on a essayé de rendre par la figure coloriée ci-contre. Ce *Clerodendron imperialis* est-il une espèce, un hybride ou une variété, ou bien est-il simplement une vieille plante rajeunie dans les dernières années où florissait l'Empire par quelqu'un de ses adeptes, et en vue de s'en faire bien voir? C'est ce que nous ne pourrions dire. Malgré les nombreuses recherches que nous avons faites, les renseignements que nous avons pris, soit auprès des horticulteurs, soit auprès de certains botanistes très-compétents et bien au courant des plantes commerciales, nous n'avons pu rien découvrir de certain au sujet de cette plante qui, nous le répétons, est très-jolis et vraiment digne du nom qu'elle porte. Nous avons bien trouvé décrites et figurées quelques espèces de *Clerodendron* qui, par les fleurs, semblent se rapprocher de la plante dont nous parlons; mais indépen-

damment qu'aucune n'est parfaitement semblable, les descriptions ne s'accordent pas. Tel est, par exemple le *Clerod. squamatum*, Vahl.....En effet, si cette figure a quelques ressemblance avec le *Cl. imperialis* il n'en est pas de même en ce qui concerne la description, qui l'indique comme étant un 'arbre branchu' ce qui n'existe pas chez ce dernier. Tout ce que nous savons d'à peu près certain, c'est que M. Chantin, horticulteur.....l'a reçu vers 1865. Nous ne serions pourtant pas trop éloigné je croire que le *Cl. imperialis* est une forme du *Cl. Kaempferi*, bien supérieure toutfois au type duquel il nous paraît différer sensiblement. Mais quoi qu'il en soit nous avons cru devoir figurer et décrire cette plant, car en admettant même qu'elle ne soit pas nouvelle, il est toujours avantageux le rappeler ce qui est beau, surtout lorsqu'il s'agit d'une espee peu connue, et c'est ici le cas." He follows this with a full description. Examination of his type illustration shows it to belong in the synonymy of *C. japonicum* and not in that of *C. kaempferi* as previously stated by me (1940).

On the other hand, the illustration given by Hsiao (1944) shows that the plant which he describes as *C. japonicum* is really *C. kaempferi*.

*Clerodendron coccineum* H. J. Lam is based on Buijsman 74 from near Nongho Djarar, at 1200 m. altitude, Mt. Tengger, Java, collected on July 10, 1907, and on Herb. Utrecht 49914 from Japan. Lam (1919) notes that "This must be a very beautiful and decorative plant, worth cultivating". The homonymous *C. coccineum* D. Dietr. ["Dietz," on p. 363 of Lam's work] is a synonym of *C. kaempferi*.

Léveillé published the name *Clerodendron esquirolii* for two different plants on two separate pages of his 1912 work. The *C. esquirolii* on page 298 of his work is based on *Esquirol 2802* from "bois de Ta-Tham [Kweichow, China], très ombreux et chaud", collected in May of 1912, with the notation "toute l'inflorescence rouge, lie de vin, feuilles radicales, fleur 1 m. de haut sur tige simple" and proves to be *Tacca chantieri* Andre in the *Taccaceae*; the *Esquirol 3278*, cited by him in his 1915 work, also is *Tacca chantieri*. On the other hand, the *C. esquirolii* proposed on page 302 of the 1912 work is based on *Esquirol 123*, collected in July of 1904 on the "route de Pe-tien à Lo-yen", Kweichow, with the note "arbrisseau de 1--2 m., sans division, sommite ecarlate". It is this one that is *Clerodendrum japonicum* (Thunb.) Sweet.

Léveillé's *C. darrisi* is based on *J. Cavalerie 3490* from Lo-fou, Kweichow, collected in August of 1909, with the notation "arbre".

Fedde noticed the homonymous nature of Leveille's second *C. esquirolii* and proposed the substitute name, *C. leveillei*, for it and this was published for him by Léveillé in his 1914 work [which is dated "1915" by Rehder]. P'ei (1932) comments that "The fragmentary material of *Clerodendron darranii* [sic] Levl. and of *C. Leveillei* Fedde which I have examined in the Herbarium of the Arnold Arboretum, indicates their close alliance to or identity with *Clerodendron paniculatum* L."

*Clerodendron squamatum* var. *japonicum* Hassk. appears to be based on *Baker 18236* from Java, while *C. squamatum* var. *javanicum* Teijsm.

seems to be based on *Teijsmann H.B.2649*, also from Java.

*Clerodendron kaempferi* Fisch. is credited by Jackson (1893) to Morr., Ann. Soc. Gand. 1: 17 (1845) as a synonym of *C. kaempferi* (Jacq.) Sieb., but Fischer's type specimen in the Leningrad herbarium [Regel, Hort. Bot. Petrop. 61.8 "specimen authenticum"], examined by me, and beautifully represented by Morren's color plate, proves without any doubt to represent *C. japonicum*. Morren (1845) also mistakenly regarded Fischer's binomial as a synonym of *C. kaempferi* for which he used, in his text, the name *C. squamatum* Vahl.

It should also be noted here that the *Volkameria japonica* credited to "Hort. Paris" is a synonym of *C. philippinum* Schau.; that credited to just "Hort." is in part *C. philippinum* and in part *C. trichotomum* Thunb. The *Volkameria japonica* credited to Jacquin and the *V. japonica* credited to Willdenow both belong in the synonymy of *C. philippinum* f. *multiplex* (Sweet) Mold. The *Clerodendrum japonicum* var. "*planiflorum*" [= *pleniflorum*] (Schau.) Maheshwari of Raizada (1978) is also *C. philippinum* f. *multiplex*.

The Sweet reference in the Hortus Britannicus, so important in the nomenclatural history of this species, has in previous installments of the present series of notes been erroneously cited as occurring on page 322 of part "1", published between July and October, 1826; actually it occurs in part 2, published between January and March, 1827. It is correctly dated by Hara (1948), Huber (1963), Pande (1967), Raizada (1968), and Yamazaki (1966).

The Dietrich (1842) work is cited as "1839-52" by Lam (1919) and as "1843" by other workers, but volume 3, which concerns us here, was actually issued between December 29 and 31 of 1842.

Bretschneider (1898) dates the Ventenat work as "1803", but plates 31--84 were actually not effectively published until 1804. Masamune (1955) dates both Maximowicz references to *C. japonicum* "1887", but they were both actually published in 1886; he also mis-dates the original Hooker & Arnott reference to this species as "1840", when pages 241--336 of this work were actually published already in 1838. Further, he gives the author of a note in *Linnaea* 7: 105 (1832) as Champion instead of Chamisso. Wallich's Numerical List no. 1799 is mis-dated by Fang (1944) as "1828" instead of 1829. Makino (1903) mis-cites the Siebold (1830) reference to page "51".

More importantly, it should be noted that Makino (1903), Fang (1944), Sonohara & al. (1952), Masamune (1955), Huber (1963), Banerji (1965, 1966), Raizada (1968, 1978), and Walker (1976), among others, cite *Volkameria japonica* as first published in Thunberg's *Flora Japonica* in 1784 when actually it was first published by him four years earlier in the *Nov. Act. Soc. Sci. Upsal.*, volume 3.

Hara (1948) credited a "*Clerodendron kaempferi* Steud." to Steud., *Nom. Bot.*, ed. 2, 1: 383 (1840), but there it is actually written as "*Clerodendrum Kaempferi* Fisch." and given only as a synonym of *C. squamatum* Vahl. He cites two illustrations [fig. 2491 (1938) and fig. 557 (1940)] in Japanese works whose titles he gives only in Japanese characters.

Merrill (1946) notes that the original description of *Volka-*

*meria japonica* by Thunberg describes the plant as a "large tree, while it really is only a small shrub, but this does not invalidate the name". He might also have mentioned that Thunberg's original description calls for alternate leaves and a capsular fruit. As pointed out by Howard & Powell (1968), Thunberg's holotype is preserved in the herbarium at the University of Uppsala and casts no doubt on the correct application of the name. That he should have erred about the height of the plant is easily understandable when one recalls that he was held virtually under house-arrest at this time and relied on what was told to him by the actual collector who brought specimens to him.

Keys to help distinguish *Clerodendrum japonicum* from its nearest relatives may be found under *C. bethunianum* Low [58: 195--198], from its Chinese relatives under *C. henryi* P'ei [60: 180--181], and from other Indonesian wild and cultivated taxa under *C. klemmei* Elm. in the present series of notes.

Its closest relative, and the one with which it is most often confused, is undoubtedly *C. kaempferi*. The best way to distinguish the two is by the fact that in *C. japonicum* the calyx during anthesis is 10--15 mm. long and the corolla only to 2.4 cm. long, while in *C. kaempferi* the calyx during anthesis is less than 10 mm. long and the corolla is up to 3.8 cm. long.

Altschul (1973) informs us that the fruit of *C. japonicum* is edible and that the flowers have medicinal properties (this on the authority of *Tsang 21068*). Allen Smith reports that on the island of Ishigaki the plant is "associated with death".

Duke & Ayensu (1985) state that the leaves are applied to boils after the latter have been opened by pricking with a silver needle, while a decoction of the inflorescences are used in China to treat gonorrhoea, hematochezia, and nosebleed. They report that the Indonesians use the roots in treating dysentery, the leaf pulp for edema, and add the leaves to bath water in bathing newborn babies; the floral bracts are chewed in treating hematuria and are poulticed in cases of painful arthritis.

Fang (1944) cites *Fang 17194* from Szechuan, China, commenting that the plant is "cultivated commonly in various gardens in western Szechuan. It is highly appreciated for its beautiful scarlet flowers and ample inflorescences as well as for its long flower-season from May to July". His accompanying illustration includes enlargements of the ovary in cross-section and of the leaf scales. Walker (1976) cites *A. Smith 1* and *SIRI.5979 & 6186* from cultivation on Okinawa.

P'ei (1932) cites for typical *C. japonicum* the following Chinese collections: from Chekiang - *Chiao 1495* and *Ching 1900*; from Fukien - *Chang 4139*, *Chung 1672*, *2351*, & *2893*, and *Herb 3395*; from Kwangsi - *Ching 5193*; from Kwangtung - *Levine C.735*, *Peng, Tak, & Kin 541*, *Ts'ang 2123*, and *Ying 853*; from Kweichow - *Cavalerie 3490*; from Szechuan - *Esquirol 123*, *Faber 43*, *Fang 2285*, and *Wilson 4555*; from Yunnan - *Henry 12060*; and from Hainan island - *Ford s.n.*, *McClure 8854*, *Tak 25*, *Tsang, Tak, & Fung s.n.*, and *Wu 1089*.

Lam & Meeuse (1942) cite *Lam 2699 & 2775* from Karakalong, but

these collections will probably prove to be *C. kaempferi*; the same applies to the *Banerji 740* cited by Banerji (1965) and the *no. 100* cited by Sharma & Ghosh (1970) from India. The Raizada collection cited by Raizada (1978) and *no. 5218* cited by V. & H. Singh (1972) probably are *C. philippinum* f. *multiplex* (Sweet) Mold.

Material of *Clerodendrum japonicum* has been widely misidentified and distributed in herbaria as *C. kaempferi* (Jacq.) Sieb., *C. paniculatum* L., *C. speciosissimum* Van Geert, and *C. squamatum* Vahl. On the other hand, the *Tsang & al. 7674*, distributed as *C. japonicum*, actually is *C. intermedium* Cham., while *Avery 1238 & 1289*, *Chun & Tso 43442*, and *Tsui 306* are *C. kaempferi* (Jacq.) Sieb., *Gressitt 45* is *C. paniculatum* L., *Lawrence 34* is *C. speciosissimum* Van Geert, and *Maxwell 71-723* is *C. urticifolium* (Roxb.) Wall.

Citations: UNITED STATES: Maryland: *Bisset s.n.* [S.P.I.31706] (Ar--19859). MEXICO: Oaxaca: *Ll. Williams 9632* (N). Veracruz: *Hernandez A. & al. 175* (N); *R. M. King 1010* (Mi); *Matuda 541* (Mh, Mi, N); *Plunkett s.n.* [Cordoba, July 27, 1932] (F--867509, La); *J. Rzedowski 1215* (Ip); *Vazquez T. 398* (N). SURINAM: *Collector indig. 170* (Ld--photo, N--photo, Ut); *Lanjouw 578* (Ld--photo, N--photo, Ut); *Songgriep 6030* (Ut). BRAZIL: Pará: *Murça Pires & Black 1308* (N). NEPAL: *Pradham & Thapa 6437* (W--2681510). INDIA: Assam: *Biswas s.n.* [Badamtan] (Bz--20705); *Herb. Hort. Bot. Calcutt. s.n.* [Badamtan, 23/XII/1937] (N, W--1759053). BURMA: Upper Burma: *Belcher 109* (W--2212929), *791* (Ld, W--2213258, W--2213259). CHINA: Chekiang: *Ching 1900* (Ca--291979, W--1246765). Fukien: *Chang 4134* (Ca--303230); *Chung 2351* (Ca--232999, Ca--420366), *2893* (Ca--243695), *4042* (N); *Pi 6133* (Ca--308235). Hunan: *Fan & Li 424* (Bz--19733). Kiangsi: *Lau 4261* (S, W--1752958). Kwangsi: *Ching 5193* (Ca--409668, W--1248668); *Steward & Cheo 669* (Bz--19734, N, S). Kwangtung: *Peng, Tak, & Kin 541* [Herb. Canton Chr. Coll. 12540] (Ca--275183, S, W--1247885); *Tsang 21068* (Ca--11243, I, Mi, N, S). Szechuan: *A. Henry 43* (N). Yunnan: *Chow & Wan 80093* (Ld, Ld, N, Or--159823); *A. Henry 12060* (N). VIETNAM: Tonkin: *Bois 482* (S). JAPAN: Honshu: *Savatier s.n.* [Yedo] (W--2497086); *Siebold s.n.* (Mu--863); *Thunberg s.n.* (N--photo of type, W--photo of isotype). RYUKYU ISLANDS: Ishigaki: *Allan Smith 1* (W--2156856, W--2156857). Okinawa: *Walker, Sonohara, Tawada, & Amano 6186* (W--2093544). GREATER SUNDA ISLANDS: Celebes: *Steup 85* (Bz--20658). Java: *Backer 9621* (Bz--20614), *11455* (Bz--20610), *13264* (Bz--20615), *18236* (Bz--20616, Bz--20617); *Buysman 74* (Ld--photo, N--photo, Ut--43901); *Collector undetermined s.n.* (Bz--20602); *Docters van Leeuwen-Reijnvaan 4594* (Bz--20606, Bz--20607); *Franck 150* (W--1596597); *Herreveld 50* (Bz--20609), *73* (Bz--20608); *Koorders 29461b* [556\*] (Bz--20618); *Zollinger 2557* (Bz--20611, Bz--20612). CULTIVATED: China: *Chiao 1495* [Herb. Univ. Nanking 14694] (Ca--325237, W--1427049); *Fang 2285* (N). Germany: *Herb. Reg. Monac. s.n.* (Mu--3842, Mu--3843, Mu--3844); *Kreuzpointer s.n.* [Hort. Bot. Monac. 12 Oct. 1886] (Mu--1639, Mu--1640, Mu--1641); *Volke s.n.* [cult. Nordhausen] (Lu, Lu). Java: *Herb. Hort. Bot. Bogor. XV.J.A.XXXII.7* (Bz--26383), *XV.J.A.XXXIII.1* (Bz--26386), *XV.L.8a* (Bz--26482), *XV.L.10* (Bz--26484, Bz--26485, Bz, Bz, Bz); *Horsfield s.n.* [Solon] (Bm); *Teijs-*



mann 2649 H.B. (Bz--20603, Bz--20604); *Vatke* s.n. (V, V). Mexico: *F. W. Johnson* s.n. [Cordoba, 9-2c-06] (N); *Reko* 4626 (Ld--photo, N--photo, W--1084911); *Ll. Williams* 9632 (F--897930). Okinawa: *Walker, Tawada, & Amano* 5979 (N). Russia: *Collector undetermined* s.n. (L); *Herb. Fischer* s.n. (L); *Regel* s.n. [Herb. Hort. Bot. Petrop. 61.8] (E--photo, Ld--photo, N--photo). LOCALITY OF COLLECTION UNDETERMINED: *Herb. Jacquin* f. (V); *Herb. Mus. Bot. Stockholm* s.n. (S). MOUNTED ILLUSTRATIONS & CLIPPINGS: Carr., Rev. Hort. 46: 110/111. 1874 (Ld, Z); Corner & Watanabe, Illust. Guide Trop. Pl. 758. 1967 (Ld, Z); Duke & Ayensu, Med. Pl. China 2: 638. 1985 (Ld); Fang, Icon. Pl. Omiens. 1 (2): pl. 69. 1944 (It); Mak., Illust. Fl. Nipp. 186. 1940 (Ld, Ld); Mold. in Gleason, New Britt. Br. Illust. Fl. 3: 138. 1952 (Ld); Morr., Ann. Soc. Roy. Agr. Bot. Gand. 1: pl. 3. 1845 (N); Voss in Vilm., Blumengärt. 1: 832. 1895 (Ld); "W. W.", Garden Lond. 42: 563. 1892 (Ld, Z); E. H. Walker, Fl. Okin. South. Ryuk. 891. 1976 (W).

*CLERODENDRUM JAPONICUM* f. *ALBUM* (P'ei) Mold., stat. nov.

Synonymy: *Clerodendron japonicum* var. *album* P'ei, Mem. Sci. Soc. China 1 (3): 144. 1932.

Bibliography: Sweet, Hort. Brit., ed. 2, 416. 1830; p'ei, Mem. Sci. Soc. China 1 (3): 124 & 144. 1932; Mold., Phytologia 60: 181. 1986.

This form differs from the typical form of the species in having the calyx and corolla usually creamy-white.

The form is based on *Tsiang* 2506 from North Gate, Kochow, Kwangtung, China, collected in May of 1929, deposited in the herbarium of the Arnold Arboretum, Jamaica Plain, Massachusetts. It is described by the collector as an undershrub, the "leaves deep green above, light green below, flowers white".

A key to help distinguish this taxon from other Chinese taxa will be found under *C. henryi* P'ei in the present series of notes [60: 180--181]. Nothing is known to me of this plant beyond what is stated in the above meager bibliography.

*CLERODENDRUM JAUNDENSE* Gürke ex Mold., Known Geogr. Distrib. Verbenac., ed. 1, 47, 48, & 90 nom. nud. 1942.

This binomial, erroneously used by me in five publications between 1942 and 1980, is a synonym of *C. yaundense* Gürke, which will be discussed later in the present series of notes.

*CLERODENDRUM JOHNSTONI* Oliv. in H. Johnst., Kilim. Exped. Append. 344 nom. nud. 1886; Trans. Linn. Soc. Lond., ser. 2, 2: 346 [as "*Clerodendron*"]. 1887; B. Thomas, Engl. Bot. Jahrb. 68: [Gatt. Clerod.] 10, 16, 18, 42, 75, & 94. 1936.

Synonymy: *Clerodendron johnstoni* Oliv. in H. Johnst., Kilim. Exped. Append. 344. 1886. *Clerodendrum johnstonii* Oliv. apud Snowden, Grass Comm. Mt. Veg. Uganda 60. 1953.

Bibliography: Oliv. in H. Johnst., Kilim. Exped. Append. 344. 1886; Oliv., Trans. Linn. Soc. Lond., ser. 2, 2: 346. 1887; Gürke in Engl., Pflanzenw. Ost-Afr. C: 341. 1895; J. G. Baker in Thiselt.-

Dyer, Fl. Trop. Afr. 5: 293 & 300. 1900; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 1, 101. 1901; Mildbr. in Von Mecklenb., Deutsch. Zentral-Afr. Exped. 2: 282. 1911; DeWild., Bull. Jard. Bot. Brux. 7: 170. 1920; DeWild., Pl. Bequaert. 2: 262. 1922; T. C. E. Fries, Notizbl. Bot. Gart. Berlin 8: 701. 1924; Good & Exell, Journ. Bot. Brit. 68, Suppl. 2: 142. 1930; Chiov., Fl. Somalia 2: 363. 1932; Staner in Lebrun, Bull. Agr. Congo Belge 25: 425. 1934; B. Thomas, Engl. Bot. Jahrb. 68: [Gatt. Clerod.] 10, 16, 18, 42, 75, & 94. 1936; Ball, Kew Bull. Misc. Inf. 1937: 24. 1937; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 2, 101. 1941; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 48--50 & 90. 1942; Glover, Prov. Check List Brit. Ital. Somal. 266. 1947; Mold., Alph. List Inv. Names Suppl. 1: 6. 1947; W. Robyns, Fl. Sperm. Parc Nat. Albert 2: 142 & 147, pl. 14. 1947; Mold., Alph. List Cit. 2: 593 & 640. 1948; H. N. & A. L. Mold., Pl. Life 2: 65. 1948; Mold., Alph. List Cit. 3: 729 (1949) and 4: 1097 & 1247. 1949; Mold., Known Geogr. Distrib. Verbenac., ed. 2, 115--117 & 182. 1949; Snowden, Grass Comm. Mt. Veg. Uganda 24, 54, 60, & 94. 1953; J. K. Jacks., Journ. Ecol. 44: 362, 363, & 365--367. 1956; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 3, 101. 1959; Mold., Résumé 141, 143, 144, 146, 149, 265, 272, & 450. 1959; Dale & Greenway, Kenya Trees Shrubs 583--584. 1961; Cuf., Bull. Jard. Bot. Brux. 32: Suppl. 799. 1962; Watt & Breyer-Brandwijk, Med. Poison. Pl. S. East Afr., ed. 2, 1048 & 1372. 1962; F. White & Angus, For. Fl. North. Rhodes. 365 & 367--[369], fig. 65. 1962; J. A. Hutchinson, Journ. Tangan. Soc. 64: 105. 1965; Glover, Gloss. Bot. Kipsig. Names Kenya, ed. 1, 158. 1967; Mold., Résumé Suppl. 15: 5 (1967) and 16: 7. 1968; Glover, Stewart, Fumerton, Martindany, & Andersen, Gloss. Bot. Kipsig. Names, ed. 2, 264. 1969; Gillett, Numb. Check-list Trees Kenya 46. 1970; J. K. Jacks. in Eyre, World Veget. Types 94, 95, 97, 98, & 100. 1971; Mold., Fifth Summ. 1: 229, 232, 233, 235, 240, 249, 448, & 463 (1971) and 2: 867. 1971; Lewalle, Bull. Jard. Nat. Belg. 42 [Trav. Univ. Off. Bujumb. Fac. Sci. C.20]: 128, 137, 7 [230]. 1972; Mold., Phytol. Mem. 2: 218, 222, 223, 225, 230, 238, & 538. 1980; Mold., Phytologia 57: 34 (1985), 58: 441 (1985), 59: 259 & 335 (1986), and 60: 270. 1986.

Illustrations: W. Robyns, Fl. Sperm. Parc Nat. Albert 2: pl. 14. 1947; F. White & Angus, For. Fl. N. Rhodes. [369], fig. 65. 1962.

A branching subscaudent or scandent shrub, 1--4 m. tall, or liana, sometimes climbing to the tops of trees, semi-heliophilous, or sometimes a tree, 5--8 m. tall, with soft woolly tomentum; trunk thin; bark gray-brown or grayish; branches more or less tetragonal, densely pubescent; twigs yellow-brown, pilose; leaves decussate-opposite or ternate; petioles elongate, articulate, the basal 5 mm. persisting as a curved, woody spine; leaf-blades large, ovate or ovate-elliptic to oblong, 5--13 cm. long, 3.5--6.5 cm. wide, apically rounded or obliquely subacuminate to cuspidate, marginally entire, basally broadly rounded or cordate, bicolored, grayish-green (dark-brown when dry) and puberulent above, densely pubescent or tomentose and ashy-gray or tawny beneath; inflorescence an ample, terminal, corymbose or corymbiform panicle, more or less dense-flowered, the ramifications robust, oblique, tawny-tomentose, some-

times also with many-flowered cymes in the upper leaf-axils; pedicels short; flowers faintly sweet-smelling; calyx campanulate, green or yellow-green, 3--4 mm. long, externally very tomentose, the teeth ovate, shorter than the tube; corolla hypocrateriform, white or whitish to cream-color, rarely pinkish, the tube 2--3 times as long as the calyx, internally yellow-green and pubescent, the limb 5-lobed, the lobes small, subequal, obovate, 3 mm. long, dorsally pale-green, ventrally white or whitish; stamens about twice as long as the corolla; filaments yellowish-white or white; anthers yellow or yellow-green, later turning brown or dark-brown; style yellowish-white or white; stigma yellow-green or greenish; fruit drupaceous, often galled when immature, the galls sometimes very large.

This species is based on an unnumbered H. H. Johnson collection from 1700 m. altitude on Mount Kilimanjaro, Tanganyika, collected in 1884, and deposited in the Kew herbarium. Good & Exell (1930) claim that *C. johnstoni* is "Very nearly related" to *C. inaequipetiolatum* Good. which, however, has smaller flowers and more hirsute pubescence.

*Clerodendrum johnstoni* has been encountered by collectors in sandy-clay soil in swamps, along roadsides, in bamboo as well as evergreen and gallery forests, arborescent *Acanthus* forests and sclerophyllous woodland, on shady humus-rich grasslands and *Acanthus* steppes, in montane forests and dry openings therein, in rocky places and upland rainforests, and at forest edges, from 200 to 3000 m. altitude, in flower in every month of the year, and in fruit in October and December. Davidse reports it "in open forests with *Podocarpus* predominant and with clumps of bamboo and open heavily grazed areas" in Kenya; in the same country Dale & Greenway (1971) describe it as "Widely spread in secondary scrub in the wetter highlands; 4,000 to 9,000 ft." Magogo describes it as a "common roadside shrub to 6 ft. tall". In Zaire Hauman refers to it as "assez commun". Scott-Elliot found it common on Mt. Ruwenzori at 7000--8000 feet altitude.

Gürke (1895) reports it "In der Kulturzone und dem unteren Urwaldrand aller Landschaften verbreitet, bis 1600 m" in East Africa generally. Maas Geesteranus describes it as "not uncommon" or "fairly common but rarely found flowering" in riparian woodland with *Conopharyngia holstii* along rivers and in clearings mixed with *Pteridium aquilinum* and *Neoboutania macrocalyx*, also in "glades at forest edge with scattered *Acacia lahai* and numerous tall shrubs, in Kenya. In the same country Gillett refers to the plant as "scandent" and found it "frequent in evergreen forest on lava with *Cordia*, *Olea*, etc." The flowers on his no. 15100 are remarkably small, but this may be due to immaturity -- the collector identified it merely as "*Clerodendrum* aff. *C. johnstonii*".

Cufodontis (1962) lists *Clerodendrum johnstoni* from Kenya, Uganda, Tanganyika, and northeastern Zaire and also (doubtfully) from Ethiopia, observing that it is a "Species montana inter 1300 et 3000 m supra mare vigens vix loco tam demisso inveni potuit". Jackson (1971) avers that it is "one of the climbers in a typical

*Acacia abyssinica* woodland with *Maesa lanceolata* which is the first woody species to appear after fires...At 1700 m. it is associated with *Albizzia*....also in forest climax with *Podocarpus*, *Olea*, and *Syzygium*....also in broken post-climax forests especially in valleys and on south-facing slopes where the ground is covered with tangled masses of climbers."

Robyns (1947) describes the species as an "Arbuste sarmenteux ou liane, orophile, habitant les lisières des formations forestières de montagne jusque dans l'étage des Bambous, repandu dans le District du Lac Albert et le District des Lacs Edouard et Kivu [in Zaire]. ainsi que dans le Ruanda occidental. En dehors du Congo Belge, cet élément silvicole et à développement variable se rencontre sur les montagnes de l'Afrique tropicale central et oriental."

The corollas are described as having been "white" on Bequaert 3620, 4268, 5921, & 5922, Davidse 7053, DeWitte 1448, Germain 1448, Gille 111, Gillett 15100, Lebrun 4414, 4743, & 5453, Maas Geesteranus 5386, Magogo 1553, Peter 11655 & 42519, and Reekmans 1593 2099, "whitish" on DeWitte 2225, "cream" on Drummond & Hemsley 1275, "yellowish-white outside, lobes white inside" on Maas Geesteranus 5757, and "rose or pink" on Lebrun 4953.

Gille describes "opposite stipules" when the leaves are immature -- a character also mentioned by Baker (1890) for *C. involucreatum* Vatke. Galled fruit may be seen on the Brussels specimen of Ghesquiere 5004. Lewalle 2440 has the inflorescences too immature for definite identification; the overall habit seems more like that of a species of *Premna*.

Vernacular names recorded for *Clerodendrum johnstoni* are the following: "gwandra", "ifumbo", "ikwandira", "iramboho", "kiankware", "kisolobi", "mdiruarosh", "mokondogoro", "mukochokocho", "munganyaha", "murigono", "muteangwai", "n'gwadrè", "shimbo", "singoronik", "singoruet", "singorwet", and "ukandra".

As to the medicinal uses of this plant among the natives: the leaves and leaf-juice or a teaspoonful of the powdered bark is used as an expectorant and to treat dyspepsia in Kenya according to Watt & Breyer-Brandwijk (1962). Gille reports that in Zaire "le jus des feuilles est donné en petite quantité une fois per jour, durant trois jours, comme anthelminthique, aux enfants".

Keys to help distinguish *C. johnstoni* from other African species will be found under *C. discolor* (Klotzsch) Vatke [59: 259--260] and *C. dusenii* Gürke [59: 335].

Baker (1900) cites for *C. johnstoni* only Johnston s.n. and Volkens 2072 from Tanganyika and Scott-Elliott 7691 from Uganda; De Wildeman (1922) cites Bequaert 3620, 4268, & 5922 from Zaire. Thomas (1936) cites Linder 2567, Scheffler 250, and Scott Elliott 7691 from Uganda; Fries 1661 & 1691 and Troll 5806 from Kenya; Endlich 359, Johnston s.n., Kandt 90, Keil 96, Merker 717, Meyer 657, Mildbraed 744, Schlieben 3592, Stolz 700, Troll 5642, and Volkens 759 from Tanganyika; and DeWitte 1448 & 2225 and Linder 2400 from Zaire. I regard Bequaert 3620, Fries 1691, and Volkens 2072 as representing var. *rubrum* Thomas.

Robyns (1947) cites for *C. johnstoni*, from Zaire: Bequaert 3620

& 4268, DeWitte 1448 & 2235, Hauman 202, Lebrun 4414, 4743, & 4953, and Linder 2400; Dale & Greenway (1961) cite Battiscombe 68, Elliot 283, Gardner 1409, Moon 748, and Scheffler 250 from Kenya; Cudfontis (1962) cites (doubtfully) Gorin 209 from Ethiopia; Glover (1967) cites Bally B.4866 and Kerfoot 2151 from Kenya; and Lewalle (1972) cites Lewalle 1637 from Burundi.

Material of *Clerodendrum johnstoni* has been misidentified and distributed in some herbaria as *C. thyrsoideum* Gürke, *Ehretia* sp., *Premna* sp., *Psychotria* sp., and even *Viburnum* sp. On the other hand, the Procter 2621, distributed as *C. johnstoni*, actually is *Premna chrysoclada* (Bojer) Gürke, while Loch, Morrison, & Wendelbo 6369 is not verbenaceous.

Citations: ZAIRE: Bequaert 5921 (Br); Claessens 42 (Br), 1491 (Br, N), s.n. [entre Shangugu et Usambura] (Br); DeWitte 1448 (Br), 2225 (Br); Germain 3540 (Br), 4062 (Br); Ghesquière 5004 (Br); Gille 111 (Br, Br, Br); Hauman 202 (Br); Humbert 7363 (Br); Jurion s.n. [Claessens 183] (Br, Br, Br); Lathouwers I.30 (Br, Br); Lebrun 3746 (Br, Br, N), 4414 (Br, N), 4953 (Br), 5453 (Br, Br); W. Robyns 2327 (Br, Br, N); Schaller s.n. [alt. 7200 ft.] (Ws), s.n. [alt. 9000 ft.] (Ws); Taton 412 (Br, Br); Van den Houdt 40 (Br), 119 (Br). BURUNDI: Lewalle 272 (Gz), 2440 (Ld, Ld); Reekmans 1593 (E--22091-78), 2099 (E--2209185). UGANDA: Ghesquière 5702 (Br, Br); Lindblom s.n. [6.1920] (S); Purselove 546 (Br); Scheffler 250 (S). TANZANIA: Tanganyika: W. L. Abbott s.n. [Kilimanjaro, 1890] (W--239906); Drummond & Hemsley 1245 (S), 1275 (B); Endlich 359 (Mu); Merker 717 (B); Peter 1442 [O.I.35] (B), 1825 [O.I.44] (B), 1919 [O.I.47] (B), 2036 [O.I.50] (B), 8637 [O.III.44] (B), 9559 [O.III.69] (B), 11655 [O.III.125] (B), 17144 [O.IV.76.1] (B), 17146 [O.IV.76.1] (B), 42348 [V.284] (B), 42364 [V.285] (B, B), 42519 [V.288] (B), 42567 [V.290] (B), 51787 [O.III.70] (B), 51788 [O.III.126] (B, B). KENYA: Davidse 7053 (Ld); J. B. Gillet 15100 (B, S); Maas Geesteranus 5386 (Ca--92276, Go, S), 5687 (Ca--92139, Go, S), 5757 (B, Ca--92119, Go, S, W--2247219); Magogo 1553 (Mu); Mearns 1942 (W--631899), 1946 (W--631904), 1973 (N, W--631932); Mettam 229 (Du--289164). MALAWI: Stolz 700 (B, B, Mu--4226, S). MOUNTED ILLUSTRATIONS: White & Angus, For. Fl. N. Rhodes. [369]. 1962 (Ld).

CLERODENDRUM JOHNSTONI VAR. RUBRUM Thomas, Engl. Bot. Jahrb. 68: [Gatt. Clerod.] 75. 1936.

Bibliography: B. Thomas, Engl. Bot. Jahrb. 68: [Gatt. Clerod.] 10 & 75. 1936; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 49 & 90 (1942) and ed. 2, 116 & 182. 1949; Mold., Résumé 141, 144, 146, & 450. 1959; Mold., Résumé Suppl. 15: 5. 1967; Mold., Fifth Summ. 1: 212, 229, 235, & 240 (1971) and 2: 867. 1971; Mold., Phytol. Mem. 2: 203, 219, 225, 239, & 538. 1980.

This variety differs from the typical form of the species in having its pubescence red-brown in color.

The variety is based on Schlieben 4130 from Maskat, at an altitude of 1500 m., Morogoro District, Tanganyika, Tanzania, collected on July 12, 1933, and deposited in the Berlin herbarium, now unfortunately destroyed.

Collectors describe this plant as a scandent, twiggy shrub or small tree, 2--8 m. tall, or liana with a spreading crown, the woody petiolar spines 1.5 cm. long and upwardly curvate, the inflorescence composed of corymbose cymes, the calyx green, the corolla white, the filaments white, and the anthers blackish. They have found it growing at the edges of woods and in the shade of the understory in rainforests with *Aframomum angustifolium*, in an area of 2500 mm. annual rainfall, at altitudes of 1500--2260 m., in anthesis in January and March to July. Schlieben refers to it as "scattered" Drummond & Hemsley encountered it "in upland rainforest by streams under *Podocarpus*, *Macaranga*, *Syzygium*, etc." in Tanganyika.

The corollas are said to have been "white" on *Bequaert 4268*, *Drummond & Hemsley 2838*, *Lebrun 4743*, *Mooney 9224*, and *Schlieben 4130 & 4515*. The only vernacular name recorded for it is "schimbo".

Thomas (1936) cites *Goetze 905*, *Prince s.n.*, *Schlieben 528, 4130, & 4515*, and *Troll 5415* from Tanganyika.

Material has been misidentified and distributed in some herbaria as *C. syringaeifolium* Baker.

Citations: ETHIOPIA: *Mooney 9224* (S). ZAIRE: *Bequaert 3620* (Br), *4268* (Br); *Ghesquière 4722* (Br, Br); *Lebrun 4743* (Br). TANZANIA: Tanganyika: *Drummond & Hemsley 2838* (B, S); *Goetze 905* (Br, N); *Peter 16505* [O.IV.47] (B); *Schlieben 528* (Br), *4130* (B--isotype), *4515* (B, Br, Mu, N, S); *Volkens 2072* (Br, L). KENYA: *Fries & Fries 1691* (Br).

*CLERODENDRUM JOHORENSE* Mold., *Phytologia* 33: 373. 1976.

Synonymy: *Clerodendrum oblongifolium* Kochummen, *Malays. Forester* 41: 29 & [31], fig. 2. 1978. *Clerodendron oblongifolium* Kochm., in herb.

Bibliography: Hocking, *Excerpt. Bot. A.28*: 260. 1976; Mold., *Phytologia* 33: 373 (1976) and 34: 265. 1976; Anon., *Roy. Bot. Gard. Kew Libr. Awaren. List* 6: 26. 1978; Kochummen, *Malays. Forester* 41: 29 & [31], fig. 2. 1978; Mold., *Phytol. Mem.* 2: 295, 393, & 538. 1980.

Illustrations: Kochummen, *Malays. Forester* 41: [31], fig. 2. 1978.

A shrub, to 1 m. tall; stems pale-grayish, tetragonal, often unbranched, ampliate at the nodes; branches and branchlets, when present, apparently very slender, densely puberulent; leaves simple, decussate-opposite; petioles very slender, elongate, 1--5 cm. long, glabrous; leaf-blades thin-membranous ["tenuiter coriacea" *vide* Kochummen], narrowly elliptic or narrowly oblong to lanceolate or sub-oblancoleate, 5--20 cm. long, 1--3.5 cm. wide, both apically and basally gradually attenuate, marginally entire, glabrous on both surfaces; secondaries about 14 pairs, arcuate, confluent near the margins, inconspicuous above, distinct beneath; inflorescence terminal, solitary, paniculate, long-pedunculate, densely puberulent, nodding, the panicle 10--30 cm. long, basally to about 10 cm. wide, with about 3 sets of opposite ramifications, each rather long and apically trifurcate, about 7-flowered, densely puberulent throughout; bracts, when present, foliaceous, diminishing in size upwards, subtending the panicle ramifications, small, long-stipitate, elliptic, 1--2 cm. long, to 4 mm. wide; bractlets linear or sublinear, to

4.5 mm. long, puberulent or lightly hirsute [fide Kochummen]; flowers pendulous, about 1.5 cm. long; calyx pale-green, campanulate, about 5 mm. long and wide, externally densely puberulent, 5-lobed, the lobes lanceolate or broadly triangular, flat, about 6.5 mm. long, apically obtuse or acute; corolla infundibular, in bud about 11 mm. long, white, the limb 5-lobate; stamens 4, attached at the base of the corolla-tube, about 5.5 mm. long; filaments 3.5 mm. long; anthers oblong, longitudinally dehiscent; style about 7 mm. long; stigma bifid; ovary cylindrical, about 1.5 mm. ["1.5 cm/" fide Kochummen] long, 4-celled, with one ovule in each cell.

This species is based on *R. B. Phillips 1640* from Mount Ophir, Johore, Malaya, collected on April 20, 1972, and deposited in the University of Malaya herbarium at Kuala Lumpur. The type of *C. oblongifolium* is FRI.5263 from along the Kota Tinggi road, Johore, deposited in the herbarium of the Forest Research Institute at Kepong, Selangor.

This very distinctive species in general greatly resembles *C. nutans* Jack and *C. wallichii* Merr.

The Cockburn SAN.76818, distributed as *C. johorensis*, actually is *C. elmeri* Merr.

Citations: MALAYA: Johore: *R. B. Phillips 1640* (Ac--photo of type, K1--16829--type, Ld--photo of type, N--photo of type); B. C. Stone 10726 (K1--15628, Ld). MOUNTED ILLUSTRATIONS: Kochummen, Malays. Forester 41: [31]. fig. 2. 1978 (Ld, Z).

*CLERODENDRUM KAEMPFERI* (Jacq.) Sieb., Verh. Batav. Genootsch. [Syn. Pl. Oecon.] 31 ["51"] [as "*Clerodendron*"]. 1830; Mold., Geogr. Distrib. Avicenn. 26 & 37. 1839 [not *C. kaempferi* Fisch., 1821 nom. nud.]

Synonymy: *Volkameria kaempferi* Jacq., Collect. Bot. 3: 207--209. 1789. *Clerodendrum squamatum* Vahl, Symb. Bot. 2: 74. 1791. *Volkameria kaempferiana* Jacq., Icon. Pl. Rar. 3: pl. 500. 1792. *Clerodendrum foliis cordatis, obscure angulatis; panicula ramis dichotomis, glabris* Vahl ex Poir. in Lam., Encycl. Méth. Bot. 5: 166 in syn. 1804. *Volkameria foliis cordatis, pubescentibus, denticulatis; panicula terminali, divericata; pedunculis coloratis* Willd. ex Poir. in Lam., Encycl. Méth. Bot. 8: 689 in syn. 1808. *Volkameria foliis cordatis, subrotundis, villosulis; floribus paniculatis, caule erecto* Jacq. ex Poir. in Lam., Encycl. Méth. Bot. 8: 689 in syn. 1808. *Volkameria koempferi* Lam. ex Poir. in Lam., Encycl. Méth. Bot. 8: 689. 1808. *Clerodendrum squamatum* Willd. apud R. Br. in Ait., Hort. Kew., ed. 2, 4: 63. 1812. *Volkameria dentata* Roxb., Hort. Beng., imp. 1, 46 hyponym. 1814; Fl. Indica, ed. 2, imp. 1, 3: 61. 1832. *Volkameria kaempferi* Willd. apud Steud., Nom. Bot. Phan., ed. 1, 207 in syn. 1821; Edwards, Bot. Reg. 8: pl. 649. 1822. *Volkameria kaempferia* Willd. apud Blume, Cat. Gewass., imp. 1, 85. 1823. *Clerodendron squamatum* Vahl ex Spreng. in L., Syst. Veg., ed. 16, 2: 759. 1825 [not *C. squamatum* H. J. Lam, 1923, nor Neal & Metzger, 1934, nor Rock, 1934]. *Volkameria coccinea* Loisel.-Desl., Herb. Amat. 8: pl. 519. 1827. *Clerodendrum squamatum* H. K. ex Loud., Encycl. Pl. 522. 1829. *Clerodendron dentatum* Roxb. ex Wall., Numer. List [49], no. 1799 hyponym. 1829. [to be continued]